

What is claimed is:

- 1 1. A slurry, comprising a mixture of:
2 a surfactant; a chelating buffer system; an abrasive; an oxidizer; and a
3 corrosion inhibitor.
- 1 2. The slurry of Claim 1, wherein the surfactant comprises
2 cetyltrimethylammonium bromide dissolved in the mixture.
- 1 3. The slurry of Claim 1, wherein the surfactant comprises
2 cetyltrimethylammonium cations and halogen anions.
- 1 4. The slurry of Claim 3, wherein the abrasive comprises silica, the corrosion
2 inhibitor comprises benzotriazole, and the oxidizer comprises hydrogen peroxide
3 dissolved in the mixture.
- 1 5. The slurry of Claim 1, wherein the chelating buffer system comprises
2 ammonium bicitrate and potassium citrate dissolved in the mixture.
- 1 6. The slurry of Claim 1, wherein the chelating buffer system is selected from
2 the group consisting of citric acid/potassium citrate, and ammonium
3 bicitrate/potassium citrate.
- 1 7. The slurry of Claim 1, wherein the corrosion inhibitor is selected from the
2 group consisting of benzotriazole and cetyltrimethylammonium bromide.

1 8. The slurry of Claim 1, wherein the surfactant comprises between 0.003M
2 and 0.075M cetyltrimethylammonium bromide in the mixture.

1 9. The slurry of Claim 1, wherein the surfactant comprises
2 cetyltrimethylammonium hydroxide dissolved in the mixture.

1 10. The slurry of Claim 1, wherein the surfactant comprises both
2 cetyltrimethylammonium hydroxide and cetyltrimethylammonium bromide
3 dissolved in the mixture.

1 11. A copper polish slurry, comprising in combination:
2 water, a surfactant, a chelating buffer system, an abrasive, a oxidizer, and
3 a corrosion inhibitor.

1 12. The method of Claim 11, wherein the abrasive comprises silica having a
2 surface area 500 m²/g.

1 13. The method of Claim 12, wherein the corrosion inhibitor is selected from
2 the group consisting of benzotriazole and cetyltrimethylammonium bromide.

1 14. The method of Claim 11, wherein the corrosion inhibitor is benzotriazole
2 and the surfactant is selected from the group consisting of
3 cetyltrimethylammonium bromide and cetyltrimethylammonium hydroxide.

1 15. The method of Claim 14, wherein the slurry has a pH of 3.8 and a density
2 of 1.03 g/ml.

1 16. The method of Claim 15, wherein the oxidizer comprises hydrogen
2 peroxide; and the chelating buffer system comprises citric acid and potassium
3 citrate.

1 17. A method of making a slurry for the chemical mechanical polishing of
2 copper and copper diffusion barriers, comprising:

3 combining a surfactant; a chelating buffer system; an abrasive; an
4 oxidizer; and a corrosion inhibitor.

1 18. The method of Claim 17, wherein the surfactant comprises
2 cetyltrimethylammonium bromide and cetyltrimethylammonium hydroxide.

1 19. The method of Claim 17, wherein the surfactant comprises a quaternary
2 ammonium halide.

1 20. The method of Claim 17, wherein the surfactant comprises a dimethyl
2 silicone ethylene oxide.

1 21. The method of Claim 17, wherein the surfactant comprises an alkyl
2 polyethylene oxide.

1 22. The method of Claim 17, wherein the surfactant comprises a material
2 characterized by an ability to substantially prevent abrasive particles in the slurry
3 from removing a oxide dielectric while allowing the removal of copper and
4 tantalum-based copper diffusion barriers.

1 23. The method of Claim 22, wherein, the oxide dielectric is doped so as to
2 have a dielectric constant less than that of silicon dioxide.

1 24. The method of Claim 18, wherein, the oxide dielectric is doped with
2 fluorine.

1 25. A method of polishing copper, comprising:
2 bringing a substrate coated on at least one surface with copper, into
3 contact with a polishing pad; and
4 dispensing onto the polishing pad, a slurry formed from a combination of
5 an abrasive, an oxidizer, and a surfactant.

1 26. The method of Claim 25, wherein the surfactant is selected from the group
2 consisting of quaternary ammonium halide, dimethyl silicone ethylene oxide, and
3 alkyl polyethylene oxide.

1 27. The method of Claim 25, wherein the surfactant comprises
2 cetyltrimethylammonium bromide.

1 28. The method of Claim 25, wherein the surfactant is characterized by an
2 ability to substantially prevent abrasive particles in the slurry from removing a
3 oxide dielectric while allowing the removal of copper and tantalum-based copper
4 diffusion barriers.

1 29. The method of Claim 27, wherein a concentration of
2 cetyltrimethylammonium bromide in the slurry is in the range of 0.003M to
3 0.075M.

1 30. The method of Claim 25, wherein the surfactant comprises
2 cetyltrimethylammonium hydroxide.

00915690-11600